

USAWC STRATEGY RESEARCH PROJECT

**IS THE CURRENT ARMY AVIATION MAINTENANCE STRATEGY
EFFICIENT OR EFFECTIVE IN THE POST COLD WAR, NON-LINEAR
BATTLEFIELD ERA OF EXPEDITIONARY FORCE PROJECTION?**

by

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ABSTRACT

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Army Aviation Maintenance performance has slowly declined over the past 20 years and is currently lacking of any comprehensive 21st Century strategy to prepare it to support the Transformation of Army Aviation as an Expeditionary Force. The key questions aviation planners must answer are as follows:

- What is Army Aviation's Expeditionary Strategy?
- Is the current Aviation Unit Maintenance (AVUM) and Aviation Intermediate Maintenance (AVIM) Table of Organization and Equipment (TO&E) the right organizational structure for Army Aircraft maintenance in the 21st Century?
- Should Army Aviation keep the current three levels of maintenance, and/or combine AVUM companies and AVIM companies under one maintenance battalion command?
- Is the current Army Aviation Maintenance strategy efficient or effective in the Post Cold War, non-linear battlefield, in an era of Expeditionary Force Projection and what added capabilities or interoperability does it bring to the fight?

Over the past 35 years the Army Aviation Maintenance philosophy and strategy have not significantly changed. During 1969, in a search for a maintenance strategy to meet the needs of the high helicopter operational tempo (OPTEMPO) of the Vietnam War, the Army reorganized aviation maintenance into a semi-decentralized design consisting of three levels of maintenance. From 1969 to 1985 this system was managed for the commanders under one maintenance officer. After Army Aviation became a branch in 1983, Army Aviation Organizations changed from the H Series TO&E to the L Series TO&E. This change further decentralized maintenance and removed the Aviation Maintenance Officer from full responsibility for aircraft maintenance. The question today: Is the current Army Aviation Maintenance Strategy Efficient and Effective in The Post Cold War, Non-Linear Battlefield, in an Era of Expeditionary Force Projection and what added capability or interoperability does it bring to the fight under the current Army Aviation Maintenance strategy?

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IS THE CURRENT ARMY AVIATION MAINTENANCE STRATEGY EFFICIENT OR EFFECTIVE IN THE POST COLD WAR, NON-LINEAR BATTLEFIELD ERA OF EXPEDITIONARY FORCE PROJECTION?

"We intend to get to trouble spots faster than our adversaries can complicate the crisis, encourage de-escalation through our formidable presence and if deterrence fails, prosecute war with an intensity that wins at the least cost to us and our allies and sends clear messages to all who threaten America."

General Eric K. Shinseki, Chief of Staff of the Army¹

"...We will aggressively reduce our logistic footprint and replenishment demand. This will require us to control the numbers of vehicles we deploy, leverage reach back capabilities, invest in a system approach to weapons and equipment we design, and revolutionize the manner in which we transport and sustain our people and materiel..."

General Eric K. Shinseki, Chief of Staff of the Army²

"The United States Air Force has always been expeditionary. We are going back to our roots. Expeditionary Air Force is a mindset that prepares us to respond rapidly anywhere in the World."

General Michael E. Ryan, Chief of Staff of the Air Force³

"...we need to change service processes, organizations and doctrine rather than modernization, procurement and technology upgrades as key to increasing capabilities and combat power. ...we need a new Joint and Expeditionary Mindset..."

Extract from CJCS and each service Chief of Staff's comments at the 34th Annual IFPA/Flecher School Conference, 2-3 Dec 2003. ⁴

"...I have more than a million people in Active Component/Reserve Component Army, but can access only a small portion because of **archaic organizations and force structure**."

—General Pete Schoomaker, Chief of Staff of the Army⁵

It is a clear message from the Army and Air Force Chief of Staff's comments above, that their fundamental philosophical approach to deterrence, war, strategic force deployment, and transformation are very similar. However, the rank and file perception may reflect a more dissimilar view particularly in the area of strategic force design, sustainment of the force, and expeditionary nature of that force.

For Army Aviation leaders to help the Army Chief of Staff (ACS) transform Army Aviation the following key questions must be answered:

- What is Army Aviation's Expeditionary Strategy?
- Is the current AVUM and AVIM table of organization and equipment (TO&E) the right organizational structure for Army Aircraft maintenance in the 21st Century?
- Should Army Aviation keep the current three levels of maintenance, and/or combine AVUM companies and AVIM companies under one maintenance battalion command?
- Is the current Army Aviation Maintenance strategy efficient or effective in the Post Cold War, Non-Linear Battlefield, in an Era of Expeditionary Force Projection and what added capabilities or interoperability does it bring to the fight?

Army Aviation and in particular Army Aviation Maintenance may have some decisive changes to make if Army Aviation is to transform within the guidance of the Chief of Staff of the Army. Why make any decisive changes to Army Aviation Maintenance? Army Aviation Maintenance has made little or no in-roads into experimentation or capability based transformation of their maintenance strategy, processes or organizational structures in the past 45 years and there is no plan or strategy currently on the table to transform Army Aviation Maintenance.⁶

The last study that launched the reorganization of Direct Support (DS) Aircraft Maintenance (now called AVUM-Aviation Unit Level Maintenance) within divisional or Corps aviation units occurred in April 1969 (See Figures 1 and 2 for 1969 assault and attack helicopter organizational design with DS/AVUM Service/Maintenance Platoon).⁷ This 1969 study found that the DS aviation maintenance concept increased aircraft operational readiness rates and improved the quality of maintenance when decentralized to the unit level (note: this was at a high cost in personnel and equipment; a requirement of efficient organizations).⁸ Since April 1969, and the release of this study, Army Aviation Maintenance has had relatively the same maintenance system: AVUM - flight line and battalion organizational/DS level; AVIM – Divisional Support Command (DISCOM)/Group GS level; and Depot (See Figures 3, 1984 sample UH-1 assault helicopter organizational design with AVUM Maintenance Platoon). The next major reorganization of Army Aviation units occurred in 1986. The 1986 Army of Excellence (AOE) overhaul of the Army reorganized the Army's Corps and Divisional TO&Es.⁹ It was during this era of change that Aviation attack and lift companies TO&Es from the 1960's and 70's design were reorganized into battalions (CH-47 company TO&Es were excluded from the 1986 AOE changes). This reorganization initially only reorganized the attack and lift platoons into attack and lift companies and didn't touch the AVUM platoons. However, in 1989

the attack and lift AVUM platoons were split out of the battalion headquarters companies and reorganized into AVUM companies (See Figure 4, 1997 sample UH-60 air assault battalion with 2 x lines companies and one AVUM company). In 1994 Army Aviation began the Aviation Restructure Initiative (ARI) to correct the deficiencies in the Army of Excellence design for aviation units while retiring old aircraft and reducing logistics requirements and costs. The focus of ARI was to have organizational efficiency with a functional design of all aviation units along a single aircraft mission design series (MDS) (except the divisional cavalry troops which had both scout and attack MDS aircraft).¹⁰

What is most interesting aspect about these Army TO&E organizational changes from 1969 to the present are two issues that emerge which vastly impact on the effectiveness of aviation operations and maintenance, and the future expeditionary mode of aviation units. The first issue is the evolution of aviation units from effective centralized operational and maintenance organizations to efficient decentralized operational and maintenance organizations. The second is the move from multifunctional MDS aviation battalions to functional single MDS aviation battalions (i.e. attack and lift battalions). The implications of both issues have a tremendous impact on determining the future Army Aviation strategy to transform its maintenance units.

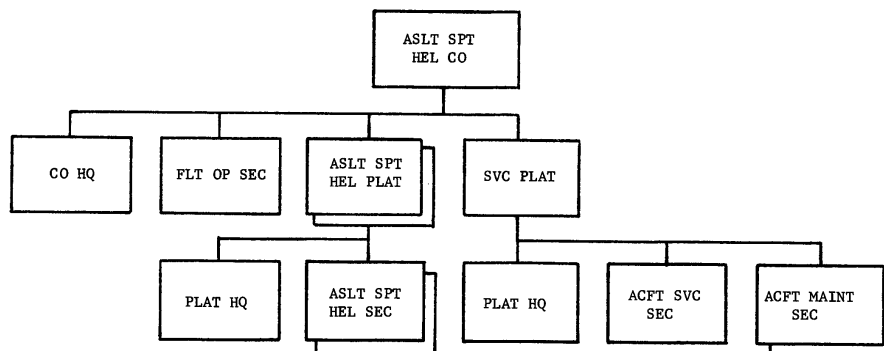


Figure 11-2. Assault support helicopter company (TOE 1-167T).

FIGURE 1. 1969 ASSAULT HELICOPTER COMPANY WITH DIRECT SUPPORT SERVICE PLATOON = AVUM PLATOON¹¹

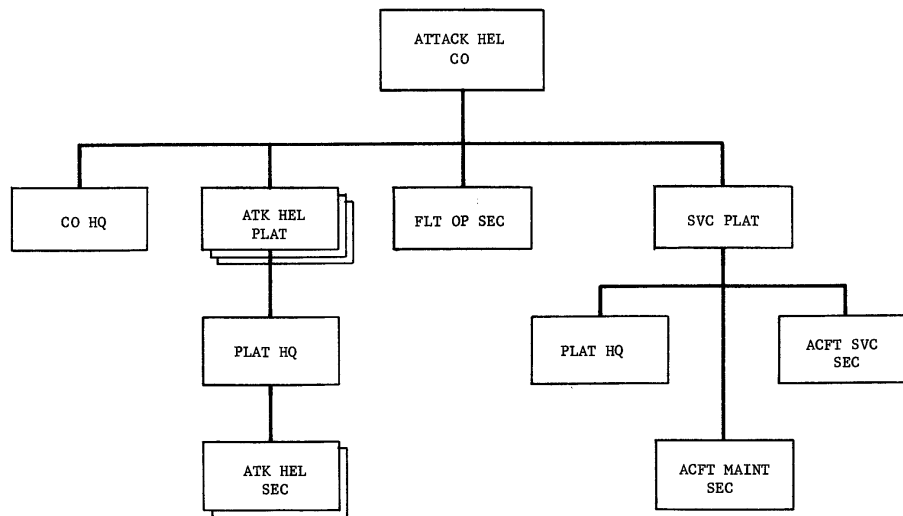


Figure 10-8. Attack helicopter company (TOE 1-157T).

FIGURE 2. 1969 ATTACK HELICOPTER COMPANY DIRECT SUPPORT SERVICE PLATOON = AVUM PLATOON¹²

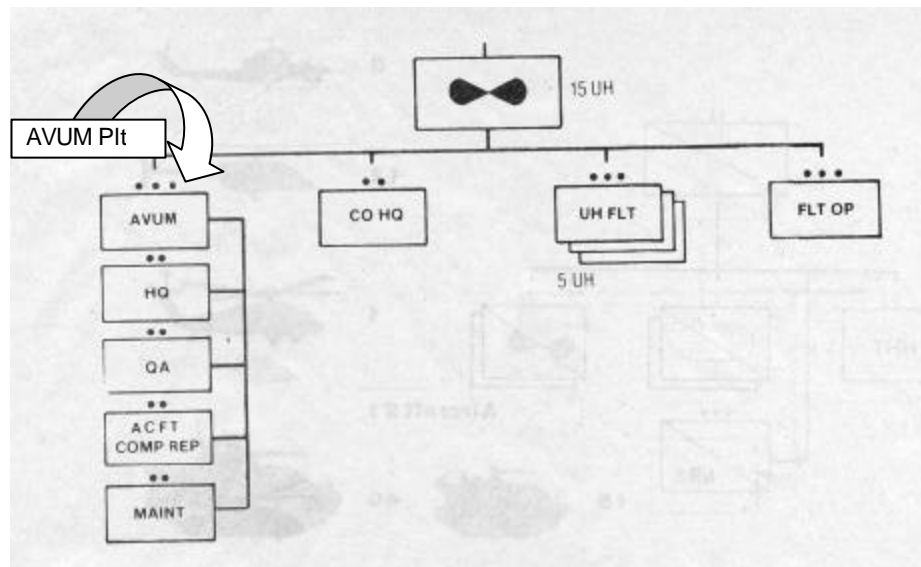


FIGURE 3. 1984 UH-1 ASSAULT COMPANY WITH AVUM PLATOON¹³

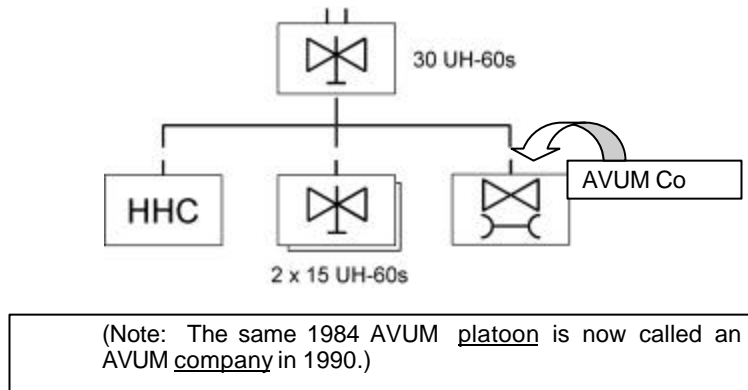


FIGURE 4. 2002 BASIC AIR ASSAULT HELICOPTER BATTALION ¹⁴

The key question for Army Aviation's leadership is do we want efficient or effective (or both) Army Aviation Maintenance units as the branch transforms to support the future joint, expeditionary force. Why do I ask this? First, about 65% of Army Aviation is Aviation Maintenance and about 75% of the equipment in aviation units (less aircraft) is in direct support (AVUM "flight line/organizational" or AVIM units) or indirect support of aircraft maintenance. Secondly, the Aviation branch leadership can not efficiently or effectively change the operational side of aviation without addressing the maintenance strategy to support the operational strategy. Why are these two comments important to the Army and Army Aviation?

Strategic capability, inter operability/inter-dependence and expeditionary modularity are just a few key buzzwords! If Army Aviation is to be relevant on the future "Joint" battlefield, all of Army Aviation, to include Aviation Maintenance, must provide a strategic capability that is expeditionary (modular) in nature while providing the warfighter with enhanced capability. In short, Army Aviation Maintenance must be transformed both to be expeditionary (modularity) and to enhance its inter-operability to support not only Army aviation units, but also helicopter units from our sister services during joint operations.

In this paper I will explain the current problems with Army Aviation Maintenance that inhibit its expeditionary capability and its effectiveness; Air Force Aviation Organizational Maintenance History – successes and failures; Navy/Marine Corps Aviation Organizational

Maintenance – what works and why; and how Army Aviation Maintenance needs to transform/restructure to be relevant on the future “Joint” battlefield.

PROBLEMS IN ARMY AVIATION MAINTENANCE THAT WILL ADVERSELY EFFECT TRANSFORMATION

Army Aviation Maintenance has six critical problems that must be addressed if Army Aviation is to transform and become more efficient, effective, and expeditionary. These six problems are poor organizational design; inefficient maintenance management; confusing Maintenance Command and Control (C2) Chains of Command; Aviation Commanders Don't Understand The Maintenance System Network; Stagnant Hierarchical Leader Mindsets; and The Lack of System Thinking.

PROBLEM 1: POOR ORGANIZATIONAL DESIGN PROBLEMS

From 1950 through October 1969 Army Aviation Maintenance Organizational design has had three levels of maintenance structure (field/organizational, DS/GS and Depot maintenance).¹⁵ Since 1969 the terminology describing the three levels of maintenance has changed, but the maintenance organizations and process strategies have not evolved to meet the changing operational environment. We still have the three same 1969 levels of aviation maintenance, with new titles, but no substantive changes to the maintenance processes and strategy, as described in FM 3-04.500. FM 3-04.500, Army Aviation Maintenance, defines the current doctrine for the Army maintenance system as a three level maintenance structure as a three level system consisting of AVUM (which encompasses flight line and organizational level Bn - tactical), AVIM (tactical/operational – division and Corps levels), and depot (strategic).¹⁶ Each level is based on specific maintenance tasks, time to repair, tools available and worker skills. Organizational maintenance tasks and responsibilities at each level are defined in the glossary/definitions on pages 23-25 of this study.

Since the end of the Cold War and Desert Storm the United States (U.S.) Army and Army Aviation have entered into an unprecedented new strategic environment. The environment was characterized by: enhanced global responsibilities, reduced forward basing, reduced forces, lack of a peer competitor, and accelerated operational tempo.¹⁷ In the latter years of the 20th Century and the first 3 years of the 21st Century the U. S. Army and Army Aviation have continued to downsize, respond to global responsibilities, maintain a high training and peace keeping OPTEMPO, and conducted combat operations in Afghanistan - Operation Enduring Freedom (OEF) and Iraq - Operation Iraqi Freedom (OIF).

During these past 13 years (1990s to present) Army Aviation Maintenance, at all levels of the maintenance structure, our soldiers and NCOs have made maintenance happen despite the shortages of equipment, personnel, and repair parts; antiquated equipment and processes; within antiquated maintenance organizations and C2 structures.

One of the most interesting observations concerning Army Aviation Maintenance deficiencies during this period of time is the increased level of AVUM tasks work ordered to the AVIM level and the superficial (non-doctrinal), non-managerial directed movement or convergence of AVUM and AVIM operations at both home stations and deployed field/airfield locations. At home stations AVIMs (divisional and non-divisional levels) have picked up more of the AVUM workload (scheduled “services & phases” and unscheduled maintenance).¹⁸ This can be directly attributed to the shortage of AVUM personnel (by TO&E and assignment); shortage of skilled soldiers at the AVUM level; shortage of tooling (TO&E shortages of Test, Measurement, and Diagnostic Equipment (TMDE) at the AVUM level and lack of redundancy of TMDE sets at the AVUM level); the shortage of repair parts (increased controlled exchange/cannibalization from aircraft to aircraft resulting in an increase of unscheduled maintenance man-hours in addition to the manpower and skill level shortages); increased flying OPTEMPO; the aging fleet (increased non-maintenance capable (NMC) time on older aircraft); and increased complexity of aircraft systems and subsystems.

If one looks at all major Army Aviation deployments (training, war, or peace keeping) over the past 13 years (1990s to present) you would see that AVIM companies and battalions (divisional and non-divisional AVIMs) deployed in part or in total and collocated on an airfields (predominate situation) or field locations with their supported AVUMs and lift/attack units. The following examples support this assertion: Albania – Army’s Task Force Hawk in Operation Allied Force; National Training Center rotations; Bosnia and Kosovo peace keeping operations (1995-current); Poland – V Corps’ Operation Victory Strike I, II, & III (2000, 2001, 2002); Haiti – Operation Restore (Uphold) Democracy (1994); Czech Republic – V Corps’ Operation Talon Strike (2001); Afghanistan – OEF (2001-current); and Iraq – OIF (2002 – current).

Much can be made of and debated about the size, make up, and mobility of Army aviation brigades or task forces and the supporting aviation maintenance structure for each aforementioned deployment. But one has to note that if the current maintenance leaders at the AVUM and AVIM levels are deliberately reorganizing/task organizing (transforming) maintenance structures or collocating in close proximity to gain AVUM and AVIM maintenance operating efficiencies (synergism and economy of force, labor, and equipment), Army Aviation leaders need to open their eyes to what the junior aviation maintenance managers are doing to

"make maintenance happen" at the tactical and operational levels of the Army. With this observation in mind, our Army Aviation leaders need to more aggressively transform Army Aviation Maintenance Organizations to meet today's needs of aviation operators and maintainers.

PROBLEM 2: INEFFICIENT AVIATION MAINTENANCE MANAGEMENT

Over the past 20 years aviation maintenance, ground support equipment and aircraft have only gotten more complex. During this same time period Army Aviation's leadership have only made the problem worse by shifting the responsibility for the unit level maintenance management away from the trained maintenance officer and pushed it on the line company commanders (non-maintenance trained) and lift/attack battalion commanders (non-maintenance trained).

In 1983 Army Aviation became a branch rather than a specialty occupation. This was soon followed by the 1986 Army of Excellence (AOE) organizational aviation TO&E changes. The 1986 AOE changes reorganized attack and lift companies into battalions with the same number of aircraft and aviation battalions turned into brigades with the same number of aircraft as before.¹⁹ When this happened maintenance managers, who were once held responsible for a company's total AVUM maintenance effort, reverted to mere managers of AVUM work orders. Meanwhile, the new line company commanders now took charge of their own maintenance management, aircraft flight hour management, and operational planning and mission execution. This aviation organizational and maintenance management change worked for a while with the vintage yet simple aircraft (UH-1Hs, AH-1s, OH-58A/Cs and CH-47B/Cs) and great abundance of senior warrant and non-commissioned officer (NCO) maintenance expertise which was still abundant within each flight company and the new AVUM Company. But as time passed, the Wall came down and the Cold War ended; the Army downsized and the senior aviation maintenance warrants and NCOs retired; unit personnel were cut; and the new aircraft grew more complex; causing the whole maintenance system and standards to begin eroding.

The pre-1986 maintenance management system was simple in the "H" Series TO&E aviation company: one maintenance officer in charge of maintenance, answering to one field grade (O-4) company commander who answered to one O-5 battalion commander. In post 1986 the maintenance management of an "L" series TO&E aviation battalion was decentralized to three line company commanders (A, B, C Co cmdrs with no maintenance management training or experience) responsible for their own AVUM/flightline aircraft maintenance and one junior O-3 maintenance officer to run the AVUM company (D Co). This new TO&E strategy of

effectiveness held every commander accountable for AVUM maintenance and no one responsible for the total battalion aircraft operational readiness (OR) rate. The post 1986 and current AVUM maintenance system still holds no single officer within the battalion totally responsible for the battalion's/squadron's aircraft maintenance or OR rate. Our operational (non maintenance) leaders of Army Aviation, in an effort to improve aviation capabilities, focused on a strategy of efficiency rather than effectiveness. In execution of that strategy they made aviation maintenance more decentralized, more complex and more ineffective in an attempt to make more operational company commands, more battalion commands and more brigade commands during the time period of "AOE."

Today, because of this error in organizational maintenance management design, every aviation unit conservatively loses one to three percent (or more) OR rate monthly due to the inefficiencies of this decentralized maintenance organizational design. The Army Aviation Maintenance management structure that exists today is simply too ineffective and inefficient to operate in the new world of high technology, complex aircraft systems and subsystems, and high OPTEMPO. Now couple the complexity of aviation technology and OPTEMPO problems with Army Aviation's struggle to be more interdependent, interoperable and expeditionary and it only exacerbates the ineffectiveness and inefficiencies of the current organizational aviation maintenance design.

PROBLEM 3: CONFUSING MAINTENANCE COMMAND AND CONTROL (C2) CHAINS OF COMMAND

Division Level Aviation Maintenance Command/Support Structure

Division AVUM command structure: At the division level AVUM companies (normally D Companies) belong to lift and attack battalions/squadrons. These same battalions/squadrons are attached to divisional aviation brigades.

Division AVIM command structure: The divisional AVIM company, which support the divisional AVUMs, belong to the divisional aviation support battalions (DASBs) (also called Aviation Support Battalions - ASBs); that are attached to their brigade command structure called the DISCOMs.

The Division AVUM and AVIM Command Problem: Divisional AVUM and AVIM company commanders work for two different battalion commanders who are in two different brigades. AVUM company commanders are in the aviation brigade and the AVIM company commander is in the DASB, which belongs to the DISCOM. Unity of effort would be enhanced by putting the DASB and its AVIM under the aviation brigade command.

Corps Level Maintenance Command/Support Structure

Corps AVUM command structure: At the Corps level the AVUM companies (normally D Companies) belong to lift and attack battalions/squadrons (AVUM platoons within Medevac Companies). These same lift and attack battalions/squadrons are attached to Corps aviation brigades.

Corps AVIM command structure: The Corps AVIM companies, which support the Corps AVUMs, belong to the Corps AVIM battalion. This Corps AVIM battalion is attached to their brigade command structure called the Corps Support Group (CSG). This CSG belongs to the Corps Support Command.

The Corps AVUM and AVIM Command problem: Corps AVUM and AVIM company commanders work for two different battalion commanders who are in two different brigades. Corps AVUM company commanders are in the Corps aviation brigade and the AVIM company commanders are in the Corps AVIM Battalion, which belongs to the CSG. Unity of effort would be enhanced by putting the Corps AVIM Bn and its AVIM companies under the Corps aviation brigade command.

Crossing Divisional or Corps Maintenance Command/Support Boundaries

Doctrine, habitual support relationships, and work orders are the methods of crossing command boundaries between AVUMs and AVIMs at the division and Corps levels. These decentralized maintenance command relationships in today's high OPTEMP force is simply ineffective, inefficient and it interferes with the synergism of unity of effort between the AVUMs and their supporting AVIM. We need the two levels of maintenance (AVUM and AVIM), but we do not need the inefficiencies of the current doctrinal maintenance command structure that was designed for the linear Cold War battlefields in the Fulda Gap. Today, maintenance managers go through the arduous process of crossing command boundaries to task organize aviation units and the supporting AVUMs and AVIMs assets only to deploy to an area of operation (AO) where the AVUMs and AVIM companies then collocate on the same airfield or field location in support of an aviation force that must fight on a non-linear battlefield.

One of the nine principles of War is "Unity of Command." In Army Aviation Maintenance we violate this at the division and Corps levels. Rather than have aviation maintenance organizations that have focused "unity of effort" under one maintenance commander we have two levels of a critical maintenance system working for two different commanders. Divisional and Corps Aviation maintenance units should operate as a closely aligned system under one

command (at their respective divisional or corps level), rather than divided by an archaic command structure that has outlived its usefulness.

The implications in the above comments, as they apply to Army Aviation Transformation and strategic support to Joint Forces, is that Army Aviation leaders need to consider two options: (1) putting divisional and Corps AVIM companies within their respective aviation brigades and (2) explore the option of combining AVUMs and AVIMs into one organization (centralized management, but decentralized execution), under one maintenance battalion commander who answers to one aviation brigade commander at the division and Corps levels. Enacting either options or both options will enhance maintenance C2 and the maintenance synergism and effectiveness of collocated AVUM and AVIM companies (See Figure 5, page 12 for a proposed, organizational maintenance redesign under the current divisional aviation brigade structure. See figure 6, page 13 for a proposed, organizational maintenance redesign under the newly proposed divisional aviation brigade structure.) The advantages of centralizing aviation maintenance under one command at the division or Corps levels are as follows:

- Centralized management under one battalion level maintenance commander who answers to one aviation brigade commander. Enhanced C2 in aviation maintenance.
- Decentralized execution of maintenance: continues habitual AVUM and AVIM support to supported battalions/squadrons.
- Streamlines command channels/relationships for AVIM support and backup AVUM support to AVUM companies.
- Reduces overhead in maintenance management structure.
- Increases ability of aviation maintenance to surge and task organize (synergy and modularization).
- Decreases CL IX stockage costs (reduces need to stock high dollar CL IX LRUs at AVUM level).
- Centralizes phase production and allows for flexibility as to where phases are done and who controls phase maintenance.
- Fixes responsibility for all maintenance on the shoulders of the maintenance officers from the AVUM Co, AVIM Co and DASB or AVIM Battalion commanders and not the operational company or battalion commander.
- New structure enhances the expeditionary nature of Army Aviation.
- New structure increases synergy and velocity of aircraft maintenance by enhancing the maintenance unit's ability to task organize or modularize for surging maintenance or deployments.

- New maintenance structure enhances Army Aviation units with the capability for interoperability to a Joint Helicopter Force.
- Increases redundancy of low density TMDE and back shop support not found at today's AVUM level.

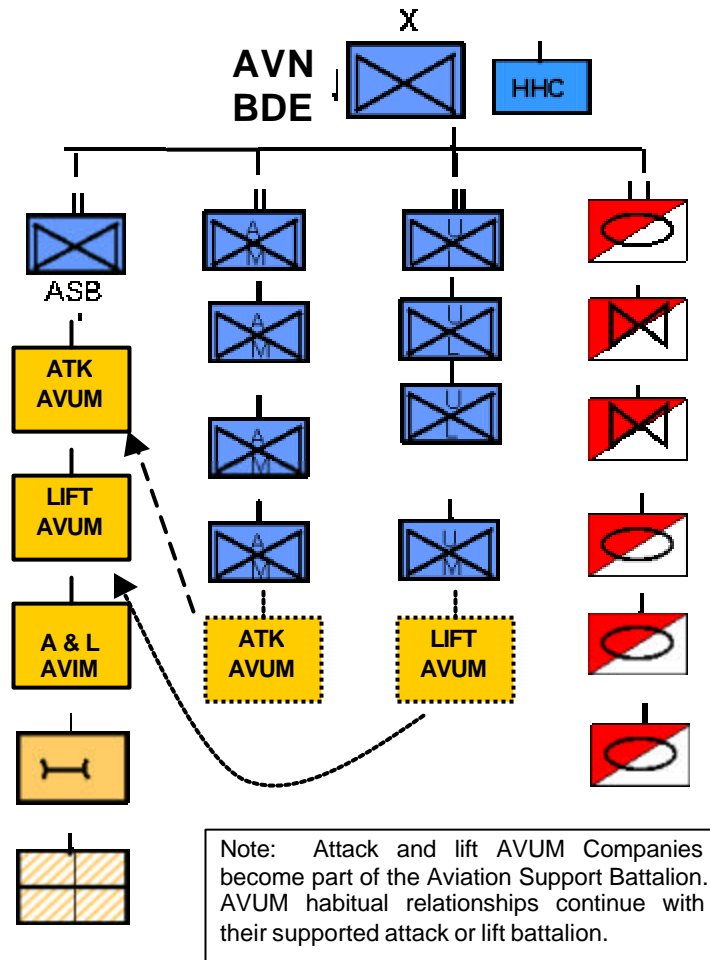


FIGURE 5. PROPOSED ORGANIZATIONAL MAINTENANCE REDESIGN UNDER THE CURRENT DIVISIONAL AVIATION BRIGADE STRUCTURE

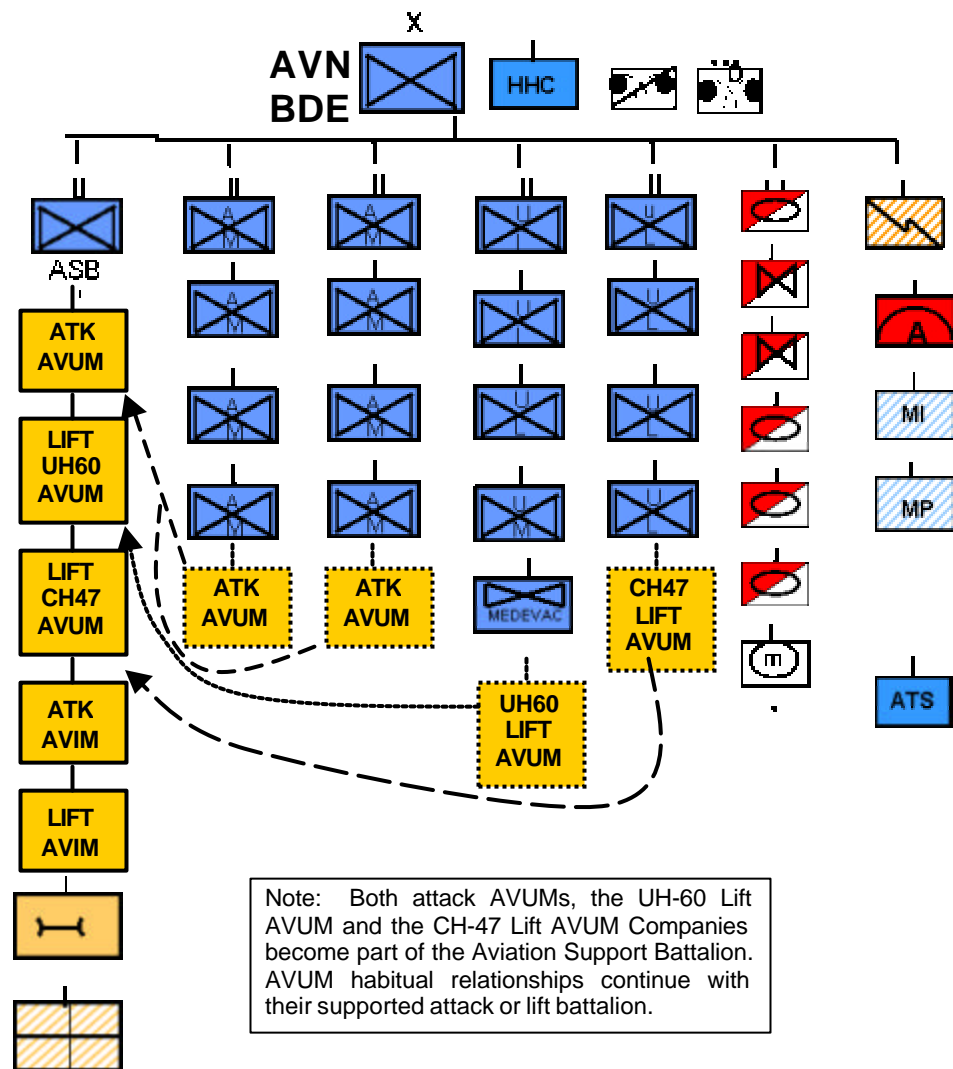


FIGURE 6. PROPOSED ORGANIZATIONAL MAINTENANCE REDESIGN UNDER THE NEWLY PROPOSED DIVISIONAL AVIATION BRIGADE STRUCTURE

PROBLEM 4: AVIATION COMMANDERS DON'T UNDERSTAND THE MAINTENANCE SYSTEM NETWORK

After 22 years of managing Army Aviation Maintenance at the AVUM and AVIM levels at both division and Corps, this author can safely say, the operational aviation company, battalion and brigade level commanders do not have a full appreciation of Army Aviation Maintenance's network concept nor in its application of the total aviation maintenance structure in today's dynamic environment. The three levels of aviation maintenance, AVUM – flight line and organizational, AVIM – division/Corps/Theater, and Depot are all parts of the total maintenance network. They cannot be viewed as independent networks, but dependent networks. Often lift/attack battalion commanders and aviation brigade commanders want to view their AVUMs as autonomous independent networks capable of being and doing all for the good of their respective battalion. From a total network view of the Army Aviation's Maintenance structure and its doctrinal design this is not only a narrow or fraudulent view, but counter productive to the design and daily working of the total network or total system. One of the key needs in the designs of current maintenance system of the 1970's, 80's and 90's was to decentralize control to its lowest level under the context of Army's doctrine of "fix forward." With this concept the Army literally meant to fix everything as far forward as possible, based on a Cold War, Fulda Gap, linear battlefield understanding of warfare. This thought process was great for a linear battlefield of the last century and non-complex aviation systems and subsystems of the 20th Century. However, this thought process is no longer applicable to the current Century's non-linear battlefield; the high technology aircraft weapon systems and their subsystems of today; and today's high flight hour/sortie OPTEMPO.

What lingers in the minds of older senior Army aviators (operators) who control the Aviation Branch are visions of an old military structure that seeks to fight the "Third World War" along fundamentally World War II or Cold War lines. Basically, Army Aviation's old guard in the Pentagon, the Beltway, and Ft. Rucker continually strives to improve aviation's aircraft/weapon technology and operating methods, but only within their comfort zones. It is time for our senior aviators to get out of their comfort zones and realize that if Army Aviation is to be relevant on the future "Joint Battlefield" our aviation leaders must change our operational and maintenance organizations so that they provide the war fighter with real "capability (attack, lift and maintenance)" rather than ineffective/inefficient organizations and irrelevant parochialism.

PROBLEM 5: STAGNANT HIERARCHICAL LEADER MINDSETS

Today's Army Aviation leaders (operators) and some maintenance managers often lack a systems or business approach to the current structure of Aviation Maintenance. Too often our leaders take the parochial approach to aviation organizational design rather than what is best for Army Aviation, the Army and the Nation. Today, the ACS is only interested in providing the war fighter with joint war fighting capability. With this in mind we need to look at Army Aviation Maintenance through the lens of a total systems approach and couple it with imagination and expertise of our junior officers and NCOs at the organizational and individual levels of decision-making. If we do this we will encourage our junior leader and maintenance managers to engage in integrating decision-making into daily ordinary business decisions for the good of the Joint War Fight Force and the Nation (not Army Aviation nor the Army). The key point here is that Army Aviation has a lot of smart junior officers and NCOs with great ideas that see the future of Army Aviation through unblemished lens's of the Cold War, who need to have their imaginations unleashed and unconstrained by the current vanguard (old guard) of Army Aviation and Army parochialism. However, we as aviation leaders allow ourselves and subordinates to become trapped within an organizational culture that creates both mental and physical boundaries or conditions, which precludes creative thinking. To overcome this constraining environment created over the years in Army Aviation, it takes a great deal of moral courage and moral imagination to step out of an entrenched system and work toward constructive change.

To accomplish this our leaders in Army Aviation need to apply, in theoretical terms, moral imagination, which involves a systemic multiple perspective approach.²⁰ This approach involves:

- Concentration on aviation maintenance networks, relationship and patterns of interaction at the flight line to AVUM and AVUM to AVIM levels of maintenance rather than on individual components that the operator owns, flight line and AVUM maintenance. This will help the operators view the maintenance networks and their relationships from different perspectives.
- Conduct a multi-perspective analysis to clearly define the problems with the current maintenance system. Then evaluate the advantages and disadvantages of the current Army Aviation System and finally explore the possibilities of a new system.

- Understanding the perspectives of the maintenance manager at each level, the supply manager, and the distribution manager that all affect the network.
- Take an evaluative perspective, by asking:
 - Who are the stakeholders within and outside the Army Aviation and Army Aviation Maintenance System? Who is the future joint force that Army Aviation Maintenance will support?
 - What capability does the total Army Aviation Maintenance System bring to the table for the Joint War Fighter? What capability should Army Aviation Maintenance bring to the table for the Joint War Fighter?
 - What values are at stake in reorganizing or not reorganizing Army Aviation maintenance?
 - Which initiatives in transforming Army Aviation and Aviation maintenance should take priority?
 - What are the constraints on transforming aviation maintenance and which ones can be circumvented?
- Proactive leadership both within the Aviation Maintenance system and without, is instrumental in initiating organizational/structural changes.

PROBLEM 6: THE LACK OF SYSTEM THINKING

A system is a set or arrangement of things so related or connected as to form a unit or organic whole,²¹ ...a system can also be an assembly of interactions within an organization or between organizations²² (flight line to AVUMs and AVUMs to AVIMs) and/or a complex of interacting components together with the relationships among them that permit the identification of a boundary-maintaining entity or process.²³

What is characteristic of the Army Aviation Maintenance System and typical to all systems is that properties or characteristics can be lost or at best, obscured, when the system is viewed or broken into components (AVUM, AVIM or Depot level maintenance).²⁴ For example, if Army Aviation leaders only focus on modernizing the fleet or TO&E structures of units and AVUMs (organizational structure) one loses the interconnections and interrelationships that characterize the total Army Aviation Maintenance System. Most importantly, if Army Aviation is to transform in total, our leadership must not only look at the aviation operational organizations, but also maintenance organizations in the reorganization. To transform Aviation Maintenance they must not only view AVUM and AVIM as one system with tremendous capability and synergism, but

our leaders must also decide on a maintenance strategy that produces effective or efficient maintenance.

Air Force, Navy and Marine Corps Aircraft Maintenance Strategies

There are numerous aircraft maintenance strategies that can be implemented to achieve a desired level of maintenance performance and effectiveness. Each U.S. military service has their unique maintenance system strategy; each with the objective of high performance and high effectiveness (high sortie rate). However, regardless of how effective or ineffective a service aviation maintenance system is or is not, each service's bottom line is that it is the maintenance officers, NCOs, and soldiers/airmen/sailors/marines that find a way to make their maintenance system work to meet high performance or effectiveness demanded by their operators. In the next few paragraphs this author will discuss each services aircraft maintenance system.

U.S. AIR FORCE

Over the past 50 years the Air Force has tried numerous maintenance organizational structures in an effort to achieve performance and effectiveness. Centralized and decentralized organizational strategies have been tried and discarded many times. The most reorganized part of the Air Force has been tactical aircraft maintenance. It has been reorganized 8 times in 50 years.²⁵ What is most important about the Air Force's reorganizations are the reasons for changing their maintenance strategies. The key reasons given for reorganizations were that it was the preferred method to deal with shortages of personnel during years of downsizing; shortage of resources (dollars); low experience levels of maintainers; or lack of performance by the maintenance organizations to produce acceptable operational readiness rates or sortie rates.²⁶

As the Air Force started out in the 1950s and 60s the maintenance structure was a functional organization (organized by specialty) with centralized control under a senior maintainer on the wing staff. The focus was an efficient use of resources, especially manpower.²⁷

During the mid 60's and on into the 70's aircraft maintenance was reorganized into divisional structures, organized by product or aircraft MDS, with decentralized control to gain organizational maintenance efficiencies of self-contained maintenance during deployments of squadrons of single MDS aircraft rather than whole wings.²⁸ This maintenance strategy worked well in Vietnam, but was costly and very manpower intensive (according to theory divisional organizations have efficient production, but are very resource intensive in dollars and manpower²⁹). The post-Vietnam era was marked by dramatic reductions in dollars and personnel.³⁰ As a result, the Air Force leader focused on efficiency and directed that all aircraft

maintenance units be reorganized back into functional organizations. However, while this functional design saved manpower dollars maintenance and sortie production continued to decline during the late 70's due to manpower shortages.³¹ It was only after looking at the Israeli maintenance strategy used during the 1973 Yom Kippur War that the Air Force developed a matrix organizational structure with centralized control called a Production Oriented Maintenance Organization (POMO) and a decentralized flight line organization called an Aircraft Maintenance Unit (AMU) both under the control of the Deputy Commander for Maintenance.³² This system worked well, only when implemented well. The POMO strategy failed, as do many matrix organizations due to poor implementation.³³

POMO lasted until the end of the 70s when General Wilbur Creech took command of Tactical Air Command. General Creech believed in decentralized decision making, but keeping maintenance under control of maintenance officers. To fix the problem he modified the matrix organization of the POMO and built a new organization, called a Combat Oriented Maintenance Operation (COMO), around several strong convictions: (1) decentralizing authority and responsibility to the lowest levels in the organization; (2) squadrons by MDS constituted the basic fighting units; and (3) performance had to be measured by sortie output.³⁴ Key to the success of the COMO strategy was taking the centralized control out of the wing staff (kept the Deputy Commander of Maintenance - DCM) and heavy oversight of maintenance by highly skilled technician and maintenance officers, and getting decentralized execution out of the AMU's.³⁵ The Air Force used this system for approximately 12 years prior to Desert Shield/Storm. This maintenance strategy used during the war was a tremendous success.³⁶ However, no matter how successful the COMO maintenance strategy was, the Post War Desert Shield/Storm reality was that the Berlin Wall and Cold War had ended in 1989 and Congress needed to cut costs. To meet these cost cuts the Air Force was going to down size. The new Air Force Chief of Staff, General Merrill A. McPeak, had to cut manpower and looked at centralizing maintenance to save money and gain efficiencies. His answer was the "Objective Wing" with centralized operations and centralized control. Once again the Air Force reacted to down sizing by reorganizing. This time, they not only cut highly skilled technicians, but also middle management. A key part of the management that the Air Force cut was middle and senior grade technicians and maintenance managers.³⁷ As a result of the reorganization and personnel cuts the "Objective Wing" concept performed poorly. The poor performance by the "Objective Wing" was proof that the new maintenance strategy failed. In a retrospective analysis of the Objective Wing, the maintenance strategy was changed back to a divisional theory of organization. The strategy was to decentralize maintenance in an effort to increase

efficiency. However, efficiency is not an attribute of a divisional organization structure.³⁸ History shows that divisional organizations require trained technicians and maintenance managers for all positions and without sufficient manning, this organization will falter. Initially when the Objective Wing strategy was implemented the Air Force had excess manpower.³⁹ However, during the draw down of the 1990s the Air Force lost not only manpower, but skilled technicians and maintenance officers.⁴⁰ In July 1995, General Joseph Ralston, Air Component Commander (ACC), acknowledged that loss of maintenance focus was adversely affecting aircraft maintenance rates and that the "Objective Wing" strategy had caused a void in maintenance management oversight in day-to-day operations. To correct the problem, General Ralston established a Deputy Operations Group Commander for Maintenance (DOGM) to reestablish senior leadership in maintenance.⁴¹ The ACC had finally taken a step back towards putting a senior maintenance manager in charge of maintenance. When the Objective Wing was tested in Operation ALLIED FORCE it performed poorly. One reason given by the DOGM for the poor performance of the Objective Wing maintenance strategy was that the maintenance organization in the operational squadrons still worked for a non-maintenance operations squadron commander.⁴² Bottom line: the squadron commanders focused on their wartime function of leading pilots in combat which limited their ability to focus on a major part of their squadron, "maintenance."⁴³

NAVY AND MARINE CORPS AVIATION MAINTENANCE STRATEGIES

The Navy and the Marine Corps Aviation units use a strategy of centralized aircraft maintenance in a divisional organization on both their aircraft carriers and Marine assault ships. Both the Navy and Marine Corps place their organizational, intermediate and limited depot forward assets into one organization (maintenance squadron) under one commander (aviation maintenance officer) who works for the wing (Navy) or squadron commander (Marine Corps) (a line aviator – non-maintenance type).⁴⁴ The strategy of using a divisional organization with centralized maintenance, in which the maintenance organization owns the aircraft and the total responsibility for meeting operational readiness rates or sortie rate is very similar to the Air Force's COMO maintenance strategy and the old Army Aviation Maintenance strategy under the Pre 1986 H Series aviation TO&Es. The key attributes of this maintenance strategy is that it is not only effective, but it has tremendous efficiencies gained from the synergy produced by two levels of maintenance, plus limited depot forward assets being encapsulated on a aircraft carrier or assault ship and under the command of one maintenance officer.⁴⁵

CONCLUSION

Army Aviation leaders are now immersed in transforming aviation battalions and brigades to meet the ACS's guidance to be more modular, mobile, expeditionary, joint, and capable on the future battlefield. The requirement for modular, scaleable aviation organizations, combined with maintenance support structures which are leaner, but packed with capability for interoperability/interdependence, has put a tough mark on the wall for our aviation leaders to meet. For the aviation maintenance portion of the force to meet this transformation goal I advocate a maintenance strategy of centralized multifunctional maintenance organizations focused on effective and efficient operations; capable of intra battalion task organizing of AVUM and AVIM personnel, shops, TMDE, tools, and repair parts; readily able to expand or contract to accommodate or release additional capabilities; and managed/commanded by maintenance officers, but part of the division or Corps aviation brigade.

This proposal is not revolutionary. Army Aviation successfully used this maintenance strategy from 1969 to 1986 and unknowingly, for the past nine years (Bosnia to OIF) the two lower levels of aviation maintenance have task organized or collocated AVUMs and AVIMs, for training or real world operations, to gain the synergism and maintenance effectiveness/efficiencies that come with collocating. In addition, all our sister military services currently use this strategy of combining the organizational and intermediate levels of maintenance under the umbrella of one maintenance squadron/battalion to gain the synergism and maintenance effectiveness/efficiencies that come with unity of effort and teaming.

What must the leaders of Army Aviation do to decisively transform the branch and remain relevant on the future battlefield. The answer lies in our leaders taking decisive action to envision a total strategy which looks at current and future mission spectrums; current functional aircraft MDS design of aviation units; and the supporting functional maintenance structure to make it more responsive, deployable, versatile, agile, lethal, survivable and sustainable. For the aviation force to be more sustainable we must develop a strategy that restructures our aviation maintenance units to make them more capable (increased synergism and velocity of maintenance), inter operability (support to other services helicopters), command enhanced (under one maintenance command), modular (task organizeable), efficient (responsive to resource constraints: dollars, personnel, TMDE, repair parts, tooling) and effective (exceed OR rates and sortie requirements).

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² Ibid.

³ John A. Tirpak, "The Leverage of Airpower," *Air Force Magazine*, May 1999, 34, Mr. Tirpak quotes General Ryan from an interview.

⁴ Ellis, Jim, ADM, COM US STRATCOM, Extracted Comments from Executive Summary of Meeting: 34th Annual IFPA / Fletcher School Conference: Security Planning & Military Transformation After Iraqi Freedom, 2-3 DEC 03 at US Chamber of Commerce Building, Washington, DC., General Michael E. Ryan, speaking as an introduction to his speech at 34th Annual IFPA / Fletcher School Conference, 2-3 Dec 03.

⁵ Ibid.

⁶ "Decentralized Direct Support Aircraft Maintenance Concept in Division Aviation Unit," Department of the Army, Army Concept Team in Vietnam, APO San Francisco 96384, 20 April 1969.

⁷ Ibid.

⁸ Ibid.

⁹ Harold W. Nelson (Editor), *ArmyH*, Bruce Jacobs (Editor), Raymond K. Bluhm (Editor), Raymond Bluhm (Editor), "The Army of Excellence (AOE)," *The Army*, November 2001, Available from <http://www.globalsecurity.org/military/agency/army/aoe.htm> accessed 2 February 2004

¹⁰ "U.S Army Aviation History," *Army Helo.com*, available from <http://www.armyhelo.com/history.htm> accessed 2 February 2004.

¹¹ Department of the Army, Aviation Battalion, Group, and Brigade, Field Manual FM 1-15 (Washington, D.C.: U.S. Department of the Army, 18 December 1969) Figure 11-2, p. 11-3.

¹² Ibid., Figure 10-3, p. 10-5.

¹³ Headquarters Department of the Army, Combat Aviation Operations, Field Manual 1-100 (Washington, D.C.: U.S. Department of the Army, 28 September 1984) Figure 2-5, p 11.

¹⁴ Headquarters Department of the Army, Utility And Cargo Helicopter Operations, Field Manual 1-113 (Washington, D.C.: U.S. Department of the Army, 12 September 1997) Figure 1-3, available from <http://www.adtdl.army.mil/cgi-bin/atdl.dll/fm/1-113/CH1.HTM#3>, accessed 4 February 2004.

¹⁵ Ibid.

¹⁶ Department of the Army, Army Aviation Maintenance, Field Manual 3-04.500 (C.1), (Washington, D.C.: U.S. Department of the Army, 26 September 2000) 2-1 – 2-2.

¹⁷ GEN Colin Powell, USA, "1993 Report on the Roles, Missions and Functions of the Armed Forces," 12 February 1993; available from <http://www.fas.org/man/doc/corm93/index.html>; Internet; accessed 23 Dec 2003.

¹⁸ Lasxlo, Alexander and Stanely Kripner: 1998, "Systems Theories: Their Origins, Foundations and Development, in J. Scott Jordan (eds.), Systems Theories and a Priori Aspects of Perception (Elsevier, Amsterdam), pp 47-74.

Post Vietnam and 1986 AOE eras were marked by dramatic reductions in dollars and personnel. These cuts at the AVUM level continue today to adversely effect the production efficiency of the decentralized, divisional (also called functional) AVUM organization. It should be noted here that according to theory, divisional organizations have efficient production, but are very resource intensive in dollars and manpower. However, if the divisional organization is under funded and under resourced in personnel (example: Post Vietnam and AOE dollar and personnel cuts), the efficiency of the divisional organizational design will not be realized. The resultant organization should be both inefficient and ineffective.

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²⁶ Ibid.

²⁷ CMSgt Robert Holritz, "Aircraft Maintenance Yesterday and Today," *Flying Safety*, Vol 48, No. 11, (November 1992): 23-25.

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³⁰ *Ibid.*, Reiter 16.

³¹ *Ibid.*, Reiter 16.

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³³ Flamholtz and Randle, 184.

³⁴ Peter U. Sutton, *Visionary Leadership-general W. L. Creech 1978-1984*, (Industrial College of the Armed Forces, National Defense University, Research Report, 1991), 12.

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³⁶ Murray Hammich, "Report from the Front---AMUs Understate in Air Force Success," *International Defense Review*, *Jane's*, (May 1991): 451-452.

³⁷ VADM P. A. Tracey, "The Case for Agility --- Adapting Military Human Resources to a Changing World," Briefing to the Air Command and Staff College, 12 Jan 00.

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⁴⁵ Ibid. para 7.4

GLOSSARY/ DEFINITIONS

ABBREVIATIONS AND ACRONYMS

acft aircraft
 ACFT COMP REP aircraft component repair section
 ACFT MAINT SEC aircraft maintenance section
 ACFT SVC SEC aircraft service section
 ACS Army Chief of Staff
 AHB assault helicopter battalion
 ALO air/aviation liaison officer
 ALOC administrative/logistics operations center
 AO area of operations
 AOE Army of Excellence
 AOR area of responsibility
 AR Army regulation
 ARI Aviation Restructure Initiative
 ASB aviation support battalion
 ASLT assault
 ASLT SPT HEL CO assault support helicopter company
 ASLT SPT HEL PLAT assault support helicopter platoon
 atk attack
 ATK HEL PLAT attack helicopter platoon
 ATK HEL SEC attack helicopter platoon
 AVIM aviation intermediate maintenance
 avn or Avn aviation
 AVUM aviation unit maintenance

BDE brigade
 BN or Bn battalion
 Branch reference to Aviation Branch

C2 command and control
 C3 command, control, and communications
 CAB command aviation battalion
 CAC command aviation company
 CJCS Chief of the Joint Chiefs of Staff
 CMD command
 Cmdr commander
 CL class (used to refer to a class of supply, i.e. CL IX repair parts)
 CO company
 CO HQ company headquarters
 COSCOM corps support command
 CSAB combat support aviation battalion
 CSG Corps Support Group
 CSS combat service support

DA Department of the Army
 DASB Divisional Aviation Support Battalion (contains one AVIM Co)
 DISCOM division support command
 DS direct support

EAC echelons above corps

Fig Figure

FLT OP flight operations

FLT OP SEC flight operations section

FM Field Manual

FW fixed wing

GSAB general support aviation battalion

Hel/HEL helicopter

HQ CO headquarters company

HHC headquarters and headquarters company

HQ headquarters

JTF joint task force

LRUs Line Replaceable Units (Class IX parts)

MAINT maintenance or maintenance section

MDS mission design series (referring to specific type of aircraft, i.e. UH-60, CH-47, AH-64, etc.)

MEDEVAC medical evacuation

Medevac referring to a helio medical evacuation unit

MTOE modification table of organization and equipment

NCO noncommissioned officer

NMC non mission capable

NTC National Training Center (Ft. Erwin, CA)

OAF Operation Afghanistan Freedom

OCNUS outside continental United States

OEF Operation Enduring Freedom

OIF Operation Iraqi Freedom

OPTEMPO operational tempo

OR operational readiness

PC production control

PLAT platoon

PLT platoon

PLT HQ platoon headquarters

POC point of contact

QA quality assurance

RAS regimental aviation squadron

REP repair

RW rotary wing

SAC support aviation company

SPO support operations officer

SPT support
SVC service
SVC PLT service platoon (also know as DS maint platoon or AVUM platoon)

TAC tactical
TC training circular
TF task force
TM technical manual
TMDE test, measurement, and diagnostic equipment
TO&E table of organization and equipment
TRADOC US Army Training and Doctrine Command

UH utility helicopter
UH FLT utility helicopter flight platoon
US United States
USAF United States Air Force

V Corps Fifth US Army Corps (Europe)

AVUM. AVUM platoons (flight line) and companies (DS AVUM battalion/squadron level support) handle aviation operational maintenance. Operational maintenance provides quick turnaround through repair by replacement, minor repairs, adjustments, cleaning, lubricating, and servicing. These platoons or companies are organic to aviation organizations at all levels. Doctrinally AVUM companies or platoons locate with or near the supported attack or lift companies/troops.¹

AVIM. The AVIM unit (company level) provides intermediate maintenance and backup AVUM support to supported units. AVIM units are either divisional or nondivisional. An AVIM company/battalion from the DISCOM provides AVIM for division-level aviation assets. These divisional AVIMs are structured to support the division's specific aircraft. Nondivisional AVIMs provide support to corps and echelons above corps nondivisional aviation units and backup support for the divisional AVIM units. AVIM companies and battalions provide intermediate and AVUM support to divisional or non-divisional. Doctrinally AVIM companies or battalions locate on major airfields or field locations in division or Corps rear areas.²

Depot. Depot level maintenance provides the ability to overhaul, repair, modify, retrofit and modernized airframes and aircraft systems. Although normally located at fixed sites in CONUS or established Theater Army support facilities (Europe and Korea), support teams may be deployed for on-site repairs as necessary at AVUM or AVIM locations.³

Interdependent: unable to exist or survive without each other. Relying on mutual assistance, support, cooperation, or interaction among constituent elements or members.

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